

**10 CSR 10-6.380 Control of NO<sub>x</sub> Emissions From Portland Cement Kilns**

(1) Applicability. This rule applies to any cement kiln located in the counties of Bollinger, Butler, Cape Girardeau, Carter, Clark, Crawford, Dent, Dunklin, Franklin, Gasconade, Iron, Jefferson, Lewis, Lincoln, Madison, Marion, Mississippi, Montgomery, New Madrid, Oregon, Pemiscot, Perry, Pike, Ralls, Reynolds, Ripley, St. Charles, St. Francois, St. Louis, Ste. Genevieve, Scott, Shannon, Stoddard, Warren, Washington and Wayne counties and the City of St. Louis that—

(A) Is a long dry kiln with an actual process rate of at least twelve tons of clinker produced per hour (12 TPH);

(B) Is a long wet kiln with an actual process rate of at least ten (10) TPH;

(C) Is a preheater kiln with an actual process rate of at least sixteen (16) TPH; or

(D) Is a precalciner or preheater/precalciner kiln with an actual process rate of at least twenty-two (22) TPH.

(2) Definitions.

(A) Clinker—The product of a Portland cement kiln from which finished cement is manufactured by milling and grinding.

(B) Long-dry kiln—A kiln fourteen feet (14') or larger in diameter, four hundred feet (400') or greater in length, which employs no preheating of the feed and the inlet feed to the kiln is dry.

(C) Long-wet kiln—A kiln fourteen feet (14') or larger in diameter, four hundred feet (400') or greater in length, which employs no preheating of the feed and the inlet feed to the kiln is a slurry.

(D) Low-NO<sub>x</sub> burners—A type of cement kiln burner (a device that functions as an injector of fuel and combustion air into kiln to produce a flame that burns as close as possible to the center line of the kiln) that has a series of channels or orifices that 1) allow for the adjustment of the volume, velocity, pressure, and/or direction of the air carrying the fuel, known as primary air, into the kiln, and 2) impart high

momentum and turbulence to the fuel stream to facilitate mixing of the fuel and secondary air.

(E) Mid-kiln firing—Secondary firing in kiln systems by injecting fuel at an intermediate point in the kiln system using a specially designed fuel injection mechanism for the purpose of decreasing NO<sub>x</sub> emissions through—

1. The burning of part of the fuel at a lower temperature; and

2. The creation of reducing conditions at the point of initial combustion.

(F) Portland cement—A hydraulic cement produced by pulverizing clinker consisting essentially of hydraulic calcium silicates, usually containing one (1) or more of the forms of calcium sulfate as an interground addition.

(G) Portland cement kiln—A system, including any solid, gaseous or liquid fuel combustion equipment, used to calcine and fuse raw materials, including limestone and clay, to produce Portland cement clinker.

(H) Preheater/precalciner kiln—A kiln where the feed to the kiln system is preheated in cyclone chambers and that utilizes a second burner to provide heat for calcination of material prior to the material entering the rotary kiln which forms clinker.

(I) Preheater kiln—A kiln where the feed to the kiln system is preheated in cyclone chambers prior to the final fusion, which forms clinker.

(J) Recoverable fuel—Fuels that have been permitted for use for energy recovery under 10 CSR 10-6.065.

(K) Renewable fuel—Renewable energy resources that include but are not limited to solar (photovoltaic), wind, and biomass. Biomass includes but is not limited to: agricultural crops and crop waste, untreated wood and wood wastes, livestock waste, wastepaper, and organic municipal solid waste.

(L) Definitions of certain terms specified in this rule, other than those defined in this rule section, may be found in 10 CSR 10-6.020.

(3) General Provisions.

(A) Beginning May 1, 2007 an owner or operator of any Portland cement kiln subject to this rule shall not operate the kiln during the period starting May 1 and ending September 30 of each year, unless the kiln installs and operates with one (1) of the following:

1. Low-NO<sub>x</sub> burners;
2. Mid-kiln firing;
3. An alternative control technology that is approved by the staff director, and incorporated in the federally approved SIP, and is proven to achieve emission reductions of thirty percent (30%) or greater;
4. An emission rate of:
  - A. For long-wet kilns—6.8 pounds of NO<sub>x</sub> per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.
  - B For long-dry kilns—6.0 pounds of NO<sub>x</sub> per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.
  - C. For preheater kilns—4.1 pounds of NO<sub>x</sub> per ton of clinker produced, averaged over the period from May 1 through September 30 of each year.
  - D. For preheater/precalciner kilns—2.7 pounds of NO<sub>x</sub> per ton of clinker produced, averaged over the period from May 1 through September 30 of each year; or
5. The findings of a case-by-case study committed to and conducted by the owner or operator and approved by the staff director, and incorporated into the federally approved SIP, taking into account energy, environmental, and economic impacts and other costs to determine an emission limitation that is achievable for the installation through application of production processes or available methods, systems and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of NO<sub>x</sub>.

(B) To meet the requirements of paragraph (3)(A)3. or (3)(A)5. of this rule, the owner or operator may take into

account as a portion of the required NO<sub>x</sub> reductions, physical and quantifiable measures to increase energy efficiency, reduce energy demand, or increase use of renewable or recoverable fuels.

(C) Excess Emissions During Start-Up, Shutdown, or Malfunction. If the owner or operator provides notice of excess emissions pursuant to state rule 10 CSR 10-6.050(3)(B), the director will determine whether the excess emissions are attributable to start-up, shutdown or malfunction conditions, pursuant to rule 10 CSR 10-6.050(3)(C). If the director determines that the excess emissions are attributable to such conditions, and if such excess emissions cause a kiln to exceed the applicable emission limits in this rule, the director will determine whether enforcement action is warranted, as provided in rule 10 CSR 10-6.050(3)(C). If the director determines that the excess emissions are attributable to a start-up, shutdown, or malfunction condition and does not warrant enforcement action, those emissions would not be included in the calculation of ozone season NO<sub>x</sub> emissions.

(4) Reporting and Record Keeping.

(A) Reporting Requirements. The owner or operator of a kiln subject to this rule shall comply with the following requirements:

1. By May 1, 2007, the owner or operator shall submit to the staff director the identification number and type of each unit subject to this rule, the name and address of the plant where the unit is located, and the name and telephone number of the person responsible for demonstrating compliance with this rule;

2. The owner or operator shall submit to the staff director by October 31 of each year, beginning in the year 2007, an annual report documenting for that unit:

A. The emissions, in pounds of NO<sub>x</sub> per ton of clinker produced from each affected Portland cement kiln during the period from May 1 through September 30;

B. The results of any performance testing; and

C. Cement kiln clinker production, in tons, from May 1 through September 30; and

3. If the owner or operator elects to comply with paragraph (3)(A)3. or (3)(A)5. of this rule, the owner or operator will supply, starting April 2008, the staff director with a report as specified in the compliance plan.

(B) Record Keeping Requirements.

1. Any owner or operator of a unit subject to this rule shall produce and maintain records, which shall include, but are not limited to the results of any initial performance test, the results of any subsequent performance tests, the date, time and duration of any start-up, shutdown or malfunction in the operation of any of the cement kilns or the emissions monitoring equipment, as applicable.

2. If an owner or operator elects to use subsection (3)(B) of this rule as part of the compliance plan, the owner or operator must retain records as agreed to in the approved compliance plan.

3. Daily cement kiln clinker production in tons per day.

4. Any applicable monitoring data.

5. All records required to be produced or maintained shall be retained on-site for a minimum of five (5) years and made available upon request.

(C) Monitoring Requirements.

1. An owner or operator complying with paragraph (3)(A)1. or (3)(A)2. of this rule shall maintain and operate the device according to the manufacturer's specifications as approved by the permitting agency. The monitoring shall:

A. Include parameters indicated in the manufacturer's specifications and recommendations for the low-NO<sub>x</sub> burner or mid-kiln firing system as approved by the permitting agency; and

B. Identify the specific operation conditions to be monitored and correlation between the operating conditions and NO<sub>x</sub> emission rate.

2. An owner or operator complying with paragraph (3)(A)3., (3)(A)4., or (3)(A)5. of this rule shall complete an initial performance test by May 1, 2007 and subsequent performance tests, on an annual basis, consistent with the requirements of section (5) of this rule.

3. An owner or operator may comply with the requirements in paragraph (4)(C)1. through the use of an alternative compliance method approved by the staff director and incorporated in the federally approved SIP.

4. Any deviation from the operating conditions or specifications, which result in an increase in NO<sub>x</sub> emissions, established in this paragraph constitute a violation of this rule, unless the owner or operator demonstrates to the satisfaction of the director that the deviation did not result in an increase in NO<sub>x</sub> emissions.

(5) Test Methods. NO<sub>x</sub> emission level testing shall use one (1) of the following methods as specified by 40 CFR part 60 Appendix A—Reference Methods:

(A) Method 7—Determination of Nitrogen Oxide Emissions from Stationary Sources;

(B) Method 7A—Determination of Nitrogen Oxide Emissions from Stationary Sources—Ion Chromatographic Method;

(C) Method 7C—Determination of Nitrogen Oxide Emissions from Stationary Sources—Alkaline-Permanganate/Colorimetric Method;

(D) Method 7D—Determination of Nitrogen Oxide Emissions from Stationary Sources—Alkaline-Permanganate/Ion Chromatographic Method; or

(E) Method 7E—Determination of Nitrogen Oxide Emissions from Stationary Sources (Instrumental Analyzer Procedure).

[illegible]

None.